

WHAT IS CLAIMED IS:

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1. A process for reversible sorption of sulfur trioxide onto a sorbent comprising a) contacting from about 15% to 100% sulfur trioxide with the sorbent under anhydrous conditions at a temperature of from about 35°C to about 150°C thereby sorbing the sulfur trioxide onto the sorbent, b) desorbing sulfur trioxide from the sorbent at a temperature of from about 150°C to about 350°C at about atmospheric pressure, or under a vacuum pressure, and c) recycling said sorbent by continuously repeating steps a) and b), wherein said sorbent has a pore size of at least 0.5 nm, and consists essentially of silica or zeolite, said zeolite having a silicon to aluminum ratio in the ranges of from about 1 to about 4.4 or greater than about 5.1.
 - 10 2. The process of Claim 1 wherein a provider sorbs the sulfur trioxide onto the sorbent and provides it to a user, and the user desorbs the sulfur trioxide and recycles the sorbent to the provider.
 - 15 *Ans 8 v7* 3. The process of Claim 1 wherein the sulfur trioxide sorbed and desorbed is of purity of from about 99% to 100%.
 - 20 4. The process of Claim 3 wherein the sulfur trioxide is of a purity of at least 99.9%.
 5. The process of Claim 1 wherein the sorbent has sorbed thereon from about 3% to about 60% by weight sulfur trioxide.
 - 25 6. The process of Claim 1 wherein the sulfur trioxide is sorbed onto the sorbent at a temperature of from about 50°C to about 125°C.
 7. The process of Claim 1 wherein the sorbent is a silicalite or a zeolite having a silicon to aluminum ratio of at least 25.
 - 30 8. A sorbent consisting essentially of silica or zeolite, said zeolite having a silicon to aluminum ratio in the ranges of from about 1 to about 4.4 or greater than about 5.1, said sorbent having a pore size of at least 0.5 nm, and having adsorbed thereon a minimum of about 1% by weight sulfur trioxide.
 9. The sorbent of Claim 8 having a silicon to aluminum ratio of at least 25.
 10. The sorbent of Claim 8 in a pelletized, beaded or chopped form.
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